This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

USER SYMBOLS
NAVY - MC
ARMY - AT, MU, ME

DD FORM 1426 672-1 (Continuous)

PROCUREMENT SPECIFICATION: MIL-R-21345 TY. I CL. 1

P.A. NAVY - OS
Other Cust
ARMY - WC
AIR FORCE - 11

SUPERSEDES

TITLE
RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)

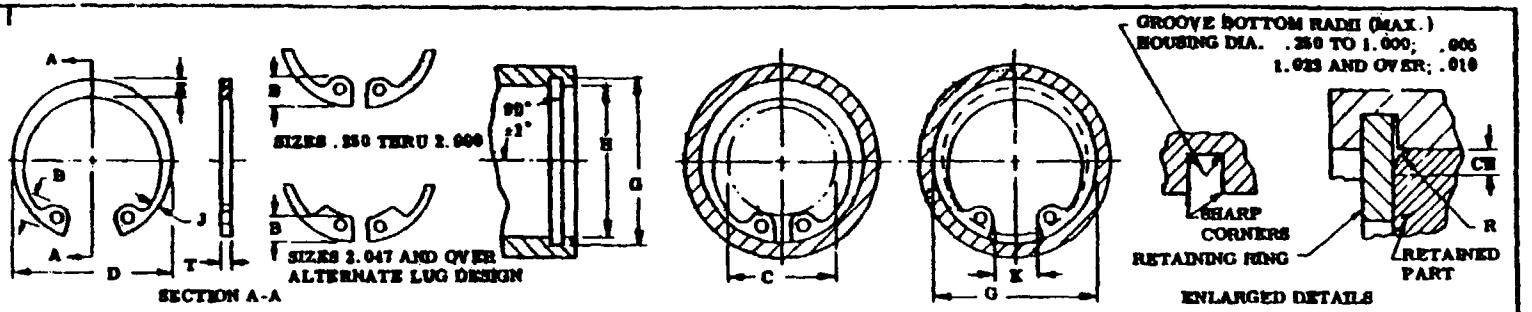
MILITARY STANDARD

MS16625

SHEET 1 OF 10

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

© ENTIRE STANDARD REVISED



H HOUSING DIAMETER		D FREE DIAMETER		B		E		J		*T		G RECOMMENDED GROOVE DIAMETER		W WIDTH		*K GAP WIDTH	*C	*R OF RETAINED PART	*CH OF RETAINED PART
INCH	MM	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	MIN.		MAX.	MAX.
													±.001						
.250	6.4	.280		.065		.025	±.002	.015	±.002	.015		.250	.0015 TIR	.018	+.002 -.000	.047	.115	.011	.0085
.312	7.9	.346		.068		.028		.018		.018		.320		.018		.058	.173	.018	.013
.375	9.6	.415		.082	±.003	.040		.028		.025		.397		.029		.063	.204	.023	.018
.438	11.1	.482		.098		.049	±.003	.028	±.002	.025		.461	±.002	.029		.063	.23	.027	.021
.453	11.5	.498		.098		.050		.030		.025		.477	.002 TIR	.029		.071	.25	.027	.021
.500	12.7	.548		.114		.063		.035		.035		.530		.039		.090	.26	.027	.021
.512	13.0	.580		.114		.063		.035		.035		.542		.039		.092	.27	.027	.021
.562	14.3	.620	+.010 -.005	.132		.063		.035		.035		.596		.039		.095	.275	.027	.021
.625	15.9	.694		.132		.060	±.004	.035	±.004	.035	±.002	.665	±.002 .004 TIR	.039	+.003 -.000	.104	.34	.027	.021
.688	17.5	.763		.132		.063		.036		.035		.732		.039		.110	.40	.027	.021
.750	19.0	.831		.142		.070		.040		.035		.798		.039		.143	.45	.032	.025
.777	19.7	.859		.146		.074		.044		.042		.825		.040		.145	.475	.035	.028
.812	20.6	.901		.155		.077		.044		.042		.862		.040		.153	.49	.035	.028
.866	22.0	.961		.156		.081		.045		.042		.920		.040		.173	.54	.035	.028
.875	22.2	.971		.158	±.006	.084		.045		.042		.931		.040		.178	.545	.035	.028
			+.015																
.901	22.9	1.000	-.010	.155		.087	±.005	.047	±.006	.042		.959	±.003	.040		.188	.565	.038	.030
.938	23.8	1.041		.155		.091		.050		.042		1.000	.004	.040		.200	.61	.038	.030
1.000	25.4	1.111		.155		.104		.062		.043		1.066	TIR	.040		.212	.665	.042	.034
1.023	26.0	1.136		.155		.106		.054		.042		1.091		.040		.220	.69	.042	.034
1.062	27.0	1.180		.180		.110		.055		.050		1.130		.056		.213	.685	.044	.035
1.125	28.6	1.249		.180		.116		.057		.050		1.197		.056		.232	.745	.047	.036
1.181	30.0	1.319	+.025	.180		.120	±.006	.058	±.006	.050		1.255	±.004	.056	+.004 -.000	.226	.78	.047	.036
1.188	30.2	1.319	-.020	.180		.120		.058		.050		1.262	.005	.056		.245	.80	.047	.036
1.250	31.7	1.388		.180		.124		.062		.050		1.330	TIR	.056		.265	.875	.048	.038
1.259	32.0	1.388		.180		.124		.062		.050		1.339		.056		.290	.685	.048	.038
1.312	33.3	1.456		.180		.130		.062		.050		1.398		.056		.284	.93	.048	.038
1.375	34.9	1.526		.180		.130		.063		.050		1.461		.056		.297	.99	.048	.038
1.378	35.0	1.526		.180		.130		.063		.050		1.464		.056		.305	.99	.048	.038
1.438	36.5	1.596		.180		.133		.066		.050		1.528		.056		.313	1.06	.048	.038
1.458	37.0	1.618		180		.133		.065		.050		1.548		.056		.320	1.08	.048	.038
1.500	38.1	1.660		.180		.133		.066		.050		1.594		.056		.340	1.12	.048	.038

APPROVED 11 DEC 1968 REVISED (A) 21 MAY 1969 (B) 15 JULY 1969 (C) 13 AUG 1968

FED. SUP CLASS 5340

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

"Review user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

USER SYMBOLS
NAVY - MC
ARMY - AT, MU, ME

DD FORM 1693 672-1

P.A. NAVY - OS
Other Cust
ARMY - WC
AIR FORCE - 11

PROCUREMENT SPECIFICATION
MIL-R-21248 TY. I CL. 1

SUPERSEDES

TITLE
RING, RETAINING, INTERNAL, BASIC
TAPERED SECTION TYPE

SHEET 2

MILITARY STANDARD
MS16625

H HOUSING DIAMETER		D FREE DIAMETER		B		E		J		*T		G RECOMMENDED GROOVE DIAMETER		W WIDTH		*K GAP WIDTH	*C	*R *CH OF RETAINED PART	
INCH	MM	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	MIN.		MAX.	MAX.
1.562	39.7	1.734		.202		.157		.078		.062		1.658		.068		.338	1.14	.064	.050
1.575	40.0	1.734		.202		.157		.078		.062		1.671		.068		.374	1.15	.064	.050
1.625	41.3	1.804		.227		.164		.082		.062		1.725		.068		.339	1.15	.064	.050
1.653	42.0	1.835		.227		.167		.083		.062		1.755	±.005	.068		.348	1.17	.064	.050
1.688	42.9	1.874	+.035	.227		.170		.085		.062		1.792	.005	.068	+.004	.357	1.21	.064	.050
1.750	44.4	1.942	-.025	.234		.171		.083		.062		1.858	TIR	.068	-.000	.372	1.26	.064	.050
1.812	46.0	2.012		.234		.170		.084		.062		1.922		.068		.382	1.32	.064	.050
1.850	47.0	2.054		.234		.170		.085		.062		1.962		.068		.392	1.38	.064	.050
1.875	47.6	2.072		.234		.170		.085		.062		1.989		.068		.420	1.39	.064	.050
1.938	49.2	2.141		.234		.170		.085		.062		2.056		.068		.438	1.45	.064	.050
2.000	50.8	2.210		.240		.170		.085		.062		2.122		.068		.453	1.50	.064	.050
2.047	52.0	2.280		.250		.186		.091		.078		2.171		.086		.428	1.52	.076	.061
2.062	52.4	2.280		.250		.186		.091		.078		2.186		.086		.468	1.54	.078	.062
2.125	54.0	2.350		.260		.195		.096		.078		2.251		.086		.460	1.58	.078	.062
2.165	55.0	2.415		.264		.199		.098		.078		2.295		.086		.439	1.61	.078	.062
2.188	55.6	2.415		.264	±.005	.199	±.007	.098	±.007	.078	±.003	2.318		.086		.489	1.64	.078	.062
2.250	57.1	2.490		.270		.203		.099		.078		2.382		.086		.478	1.69	.078	.062
2.312	58.7	2.560		.270		.206		.100		.078		2.450		.086		.486	1.75	.078	.062
2.375	60.3	2.630		.270		.207		.102		.078		2.517		.086		.504	1.81	.078	.062
2.440	62.0	2.702		.280		.209		.103		.078		2.584		.086		.518	1.86	.078	.062
2.500	63.5	2.775		.280		.210		.103		.078		2.648	±.006	.086		.532	1.91	.078	.062
2.531	64.3	2.775	+.040	.280		.210		.103		.078		2.681	.006	.086	+.005	.597	1.94	.078	.062
2.562	65.1	2.844	-.030	.290		.222		.109		.093		2.714	TIR	.103	-.000	.540	1.95	.088	.070
2.625	66.7	2.910		.290		.226		.111		.093		2.781		.103		.558	2.02	.088	.070
2.677	68.0	2.980		.300		.230		.113		.093		2.837		.103		.539	2.05	.090	.072
2.688	68.3	2.980		.300		.230		.113		.093		2.848		.103		.568	2.06	.090	.072
2.750	69.8	3.050		.300		.234		.115		.093		2.914		.103		.590	2.12	.092	.074
2.812	71.4	3.121		.300		.230		.115		.093		2.980		.103		.615	2.18	.088	.070
2.835	72.0	3.121		.300		.230		.115		.093		3.006		.103		.676	2.21	.088	.070
2.875	73.0	3.191		.310		.240		.120		.093		3.051		.103		.626	2.22	.092	.074
2.953	75.0	3.325		.310		.250		.122		093		3.135		.103		.619	2.30	.092	.074
3.000	76.2	3.325		.310		.250		.122		.093		3.182		.103		.738	2.35	.092	.074
3.062	77.8	3.418		.310		.254		.126		.109		3.248		.120		.651	2.41	.097	.078
3.125	79.4	3.488		.310		.259		.129		.109		3.315		.120		.655	2.47	.099	.079
3.140	80.0	3.523		.310		.262		.129		.109		3.341		.120		.650	2.49	.100	.080
3.156	80.2	3.523		.310		.262		.129		.109		3.348		.120		.669	2.50	.100	.080
3.250	82.5	3.623		.342		.269		.135		.109		3.446		.120		.698	2.54	.104	.083
3.344	85.0	3.734	±.055	.342		.276		.140		.109		3.546		.120		.705	2.63	.108	.086
3.469	88.1	3.857		.342		.286		.144		.109		3.675		.120		.783	2.76	.108	.086
3.500	88.9	3.890		.342	±.008	.289	±.008	.142	±.008	.108		3.710		.120		.774	2.79	.110	.088
3.543	90.0	3.936		342		292		.142		.109		3.755		.120		.788	2.83	.110	.088
3.562	90.5	3.936		.342		292		.142		.109		3.776		.120		.842	2.85	.110	.088
3.625	92.1	4.024		342		299		.150		.109		3.841		.120		.833	2.91	.116	.093

FED. SUP CLASS 5340

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for procurement use shall be made from this document.

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

P.A. NAVY - OS
Other Cust
ARMY - WC
AIR FORCE - 11

PROCUREMENT SPECIFICATION
MIL-R-21248 TY. I CL 1

SUPERSEDES

TITLE
RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)

SHEET 3

MILITARY STANDARD
MS16625

DD FORM 672-1

H HOUSING DIAMETER		D FREE DIAMETER		B		E		J		*T		G RECOMMENDED GROOVE DIAMETER		W GROOVE WIDTH		*K GAP WIDTH	*C	*R OF RETAINED PART	*CH OF RETAINED PART
INCH	MM	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	BASIC	TOL.	MIN.		MAX.	MAX.
3.740	95.0	4.157		.342		.309		.155		.109		3.964		.120		.844	3.02	.120	.096
3.750	95.2	4.157		.342		.309		.155		.109		3.974		.120		.871	3.03	.120	.096
3.875	98.4	4.291		.370		.319	±.008	.160	±.008	.109		4.107		.120		.891	3.11	.123	.098
3.938	100.0	4.358		.370		.324		.161		.109		4.174		.120		.905	3.17	.124	.099
4.000	101.6	4.424		.370		.330		.166		.109		4.240		.120		.918	3.23	.128	.102
4.125	104.8	4.558		.370		.330		.171		.109		4.365		.120		.94	3.36	.130	.104
4.250	108.0	4.691		.370		.335		.180		.109		4.490		.120		.96	3.48	.138	.110
4.331	110.0	4.756		.405		.343		.180		.109		4.571		.120		1.00	3.50	.142	.114
4.500	114.3	4.940		.405		.351		.181		.109		4.740		.120		.98	3.66	.146	.117
4.625	117.5	5.078	±.065	.405	±.008	.360		.183		.109	±.003	4.865	±.006	.120	+.005	1.00	3.79	.151	.121
4.724	120.0	5.213		.405		.370		.183		.109		4.989	.008	.120	-.000	.98	3.88	.154	.123
4.750	120.6	5.213		.405		.370		.183		.109		4.995	TIR	.120		1.03	3.90	.154	.123
5.000	127.0	5.485		.435		.390		.186		.109		5.260		.120		.97	4.06	.158	.126
5.250	133.3	5.770		.455		.408	±.009	.198		.125		5.520		.139		1.10	4.31	.168	.134
5.375	136.5	5.910		.455		.408		.198	±.009	.125		5.650	±.037	.139		1.12	4.41	.168	.134
5.500	139.7	6.066		.455		.408		.198		.125	±.004	5.770	.006	.139	-.006	1.09	4.53	.168	.134
5.750	146.0	6.336		.455		.408		.198		.125		6.020	TIR	.139	.000	1.11	4.78	.168	.134
6.000	152.4	6.620		.455		.408		.196		.125		6.279		.139		1.13	5.03	.168	.134
6.250	158.7	6.895		.485		.423		.211		.156		6.530		.154		1.16	5.24	.177	.141
6.500	165.1	7.170		.485		.438		.219		.156		6.780		.154		1.25	5.49	.181	.145
6.625	168.3	7.308	±.080	.485		.447		.221		.156		6.905		.174		1.28	5.60	.183	.145
6.750	171.4	7.445		.530		.456		.224		.156		7.055		.174		1.21	5.65	.188	.150
7.000	177.8	7.720		.530		.474		.232		.156		7.315		.174		1.26	5.88	.196	.157
7.250	184.1	7.995		.560	±.010	.489		.238		.187		7.575		.209		1.32	6.08	.202	.162
7.500	190.5	8.270		.560		.507		.247		.187		7.840		.209		1.39	6.33	.208	.166
7.750	196.8	8.545		.560		.523		.255		.187		8.100	±.008	.209	+.008	1.44	6.58	.214	.171
8.000	203.2	8.820		.600		.540		.262		.187	±.005	8.360	.006	.209	.000	1.50	6.75	.220	.176
8.250	209.5	9.095		.600		.558		.270		.187		8.620	TIR	.209		1.53	7.00	.229	.183
8.500	215.9	9.285		.660		.573	±.010	.277	±.010	.187		8.880		.209		1.71	7.13	.235	.188
8.750	222.2	9.556	±.090	.660		.591		.286		.187		9.145		.209		1.77	7.38	.241	.193
9.000	228.6	9.830		.660		.609		.294		.187		9.405		.209		1.83	7.63	.249	.199
9.250	235.0	10.102		.660		.625		.299		.187		9.668		.209		1.87	7.88	.253	.202
9.500	241.3	10.375		.735		.642		.304		.187		9.930		.209		1.91	7.98	.258	.206
9.750	247.7	10.648		.735		.658		.309		.187		10.190		.209		2.00	8.23	.263	.210
10.000	254.0	10.920		.735		.675		.315		.187		10.450		.209		2.01	8.48	.270	.216

*T = DIMENSIONS AND TOLERANCES APPLY TO UNPLATED BERYLLIUM COPPER RINGS ONLY. FOR PLATED AND CORROSION RESISTING STEEL RINGS SIZE 1.023 AND SMALLER, THE MAXIMUM T DIMENSION SHALL NOT EXCEED THE MINIMUM W DIMENSION MINUS .0002 INCH. FOR PLATED AND CORROSION RESISTING STEEL RINGS SIZE 1.062 AND LARGER THE MAXIMUM T DIMENSION MAY EXCEED THE LISTED T DIMENSION (T + TOLERANCE) BY A MAXIMUM OF .002 INCH.

*K = MINIMUM GAP WIDTH WHEN THE RING IS PROPERLY SEATED IN THE GROOVE. (DESIGN REFERENCE DIMENSION.)

*C = ACTUAL CLEARANCE DIAMETER WHEN THE RING IS SPRUNG INTO THE HOUSING, PRIOR TO INSTALLATION INTO THE GROOVE. (DESIGN REFERENCE DIMENSION.)

*R AND *CH = RADII OR CHAMFER ALLOWABLE ON PARTS TO BE RETAINED BY THE RING. THRUST LOADS OF RINGS, RETAINING PARTS WITH CORNER RADII OR CHAMFERS AS LISTED ABOVE ARE TABULATED ON SHEET 9.

TIR = (TOTAL INDICATOR READING) IS THE MAXIMUM ALLOWABLE DEVIATION OF CONCENTRICITY BETWEEN THE GROOVE AND THE HOUSING.

DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED.

SUPPLEMENTARY MANUFACTURING DIMENSIONS ARE INCLUDED IN PROCUREMENT SPECIFICATION MIL-R 21248.

FSC MCRS 5365

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

H HOUSING DIAMETER	STEEL CADMIUM PLATED	STEEL PHOSPHATE COATED	STEEL CORROSION RESISTING	BERYLLIUM COPPER
	DASH NO.	DASH NO.	DASH NO.	DASH NO.
.250	MS16625-1025	MS16625-3025	MS16625-4025	MS16625-5025
.312	-1031	-3031	-4031	-5031
.375	-1037	-3037	-4037	-5037
.438	-1043	-3043	-4043	-5043
.453	-1045	-3045	-4045	-5045
.500	-1050	-3050	-4050	-5050
.512	-1051	-3051	-4051	-5051
.562	-1056	-3056	-4056	-5056
.625	-1062	-3062	-4062	-5062
.688	-1068	-3068	-4068	-5068
.750	-1075	-3075	-4075	-5075
.777	-1077	-3077	-4077	-5077
.812	-1081	-3081	-4081	-5081
.866	-1086	-3086	-4086	-5086
.875	-1087	-3087	-4087	-5087
.901	-1090	-3090	-4090	-5090
.938	-1093	-3093	-4093	-5093
1.000	-1100	-3100	-4100	-5100
1.023	-1102	-3102	-4102	-5102
1.062	-1106	-3106	-4106	-5106
1.125	-1112	-3112	-4112	-5112
1.181	-1118*	-3118*	-4118*	-5118*
1.188	-1118*	-3118*	-4118*	-5118*
1.250	-1125*	-3125*	-4125*	-5125*
1.259	-1125*	-3125*	-4125*	-5125*
1.312	-1131	-3131	-4131	-5131
1.375	-1137*	-3137*	-4137*	-5137*
1.378	-1137*	-3137*	-4137*	-5137*
1.438	-1143	-3143	-4143	-5143
1.456	-1145	-3145	-4145	-5145
1.500	-1150	-3150	-4150	-5150
1.562	-1156*	-3156*	-4156*	-5156*
1.575	-1156*	-3156*	-4156*	-5156*
1.625	-1162	-3162	-4162	-5162
1.653	-1165	-3165	-4165	-5165
1.688	-1168	-3168	-4168	-5168
1.750	-1175	-3175	-4175	-5175
1.812	-1181	-3181	-4181	-5181
1.850	-1185	-3185	-4185	-5185
1.875	-1187	-3187	-4187	-5187
1.938	-1193	-3193	-4193	-5193
				MS16625-5200
2.000	-1200	-3200	-4200	
2.047	-1206*	-3206*	-4206*	
2.062	-1206*	-3206*	-4206*	
2.125	-1212	-3212	-4212	
2.165	-1218*	-3218*	-4218*	
2.188	-1218*	-3218*	-4218*	
2.250	-1225	-3225	-4225	
2.312	-1231	-3231	-4231	
2.375	-1237	-3237	-4237	
2.440	-1244	-3244	-4244	
2.500	-1250*	-3250*	-4250*	
2.531	-1250*	-3250*	-4250*	
2.562	-1256	-3256	-4256	
2.625	-1262	-3262	-4262	
2.677	-1268*	-3268*	-4268*	
2.688	MS16625-1268*	MS16625-3268*	MS16625-4268*	

FED. SUP CLASS 5340

APPROVED 11 DEC 1968 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

USER SYMBOLS.
NAVY - MC
ARMY - AT, MU, ME

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulars should be based on the information in the current DODISS."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repairers use shall be made from this document.

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES	SHEET 4

DD FORM SEP 67 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

H HOUSING DIAMETER	STEEL CADMIUM PLATED	STEEL PHOSPHATE COATED	STEEL CORROSION RESISTING
	DASH NO.	DASH NO.	DASH NO.
2.750	MS16625-1275	MS16625-3275	MS16625-4275
2.813	-1281*	-3281*	-4281*
2.834	-1281*	-3281*	-4281*
2.875	-1287	-3287	-4287
2.953	-1300*	-3300*	-4300*
3.000	-1300*	-3300*	-4300*
3.062	-1306	-3306	-4306
3.125	-1312	-3312	-4312
3.149	-1315*	-3315*	-4315*
3.156	-1315*	-3315*	-4315*
3.250	-1325	-3325	-4325
3.346	-1334	-3334	-4334
3.469	-1346	-3346	-4346
3.500	-1350	-3350	-4350
3.543	-1354*	-3354*	-4354*
3.562	-1354*	-3354*	-4354*
3.625	-1362	-3362	-4362
3.740	-1375*	-3375*	-4375*
3.750	-1375*	-3375*	-4375*
3.875	-1387	-3387	-4387
3.938	-1393	-3393	-4393
4.000	-1400	-3400	-4400
4.125	-1412	-3412	-4412
4.250	-1425	-3425	-4425
4.330	-1433	-3433	-4433
4.500	-1450	-3450	-4450
4.625	-1462	-3462	-4462
4.724	-1475*	-3475*	-4475*
4.750	-1475*	-3475*	-4475*
5.000	-1500	-3500	-4500
5.250	-1525	-3525	-4525
5.375	-1537	-3537	-4537
5.500	-1550	-3550	-4550
5.750	-1575	-3575	-4575
6.000	-1600	-3600	-4600
6.250	-1625	-3625	-4625
6.500	-1650	-3650	-4650
6.625	-1662	-3662	-4662
6.750	-1675	-3675	-4675
7.000	-1700	-3700	-4700
7.250	-1725	-3725	-4725
7.500	-1750	-3750	-4750
8.000	-1800	-3800	-4800
8.250	-1825	-3825	-4825
8.500	-1850	-3850	-4850
8.750	-1875	-3875	-4875
9.000	-1900	-3900	-4900
9.250	-1925	-3925	-4925
9.500	-1950	-3950	-4950
9.750	-1975	-3975	-4975
10.000	MS16625-2000	MS16625-4000	MS16625-5000

* SAME DASH NUMBERS SUITABLE FOR EITHER HOUSING DIAMETER (INCHES OR MM.)

FED. SUP CLASS 5340

APPROVED 11 DEC 1958 REVISED © FOR CHANGES SEE SHEETS 1 THROUGH 10

USER SYMBOLS: NAVY - MC ARMY - AT, MU, ME

REVIEWER SYMBOLS: NAVY - OS ARMY - WC, ML, AV AIR FORCE - 82, 85

"Review user information is current as of the date of this document. For future consideration of changes to this document, draft correction should be based on the information in the current BODIES."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for requisitions now shall be made from this document

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21348 TY. I CL. 1	SUPERSEDES	SHEET 5

DD FORM 1 SEP 57 672-1 Condensed

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

"Reviewer/user information is current as of the date of this document. For future coordination of changes to this document, draft circulations should be based on the information in the current DODISS."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

FED. SUP CLASS
5340

SUBSTITUTION TABLE
CROSS REFERENCE OF PART NUMBERS

H HOUSING DIAMETER	INACTIVE STEEL ⚠1 DASH NO.	INACTIVE STEEL ZINC PLATED DASH NO.	SUBSTITUTE STEEL CADMIUM PLATED DASH NO.
.250	MS16625 -25	MS16625 -2025	MS16625 -1025
.312	-31	-2031	-1031
.375	-37	-2037	-1037
.438	-43	-2043	-1043
.453	-45	-2045	-1045
.500	-50	-2050	-1050
.512	-51	-2051	-1051
.562	-56	-2056	-1056
.625	-62	-2062	-1062
.688	-68	-2068	-1068
.750	-75	-2075	-1075
.777	-77	-2077	-1077
.812	-81	-2081	-1081
.866	-86	-2086	-1086
.875	-87	-2087	-1087
.901	-90	-2090	-1090
.938	-93	-2093	-1093
1.000	-100	-2100	-1100
1.023	-102	-2102	-1102
1.062	-106	-2106	-1106
1.125	-112	-2112	-1112
1.181	-118	-2118	-1118
1.188	-118	-2118	-1118
1.250	-125	-2125	-1125
1.259	-125	-2125	-1125
1.312	-131	-2131	-1131
1.375	-137	-2137	-1137
1.378	-137	-2137	-1137
1.438	-143	-2143	-1143
1.456	-145	-2145	-1145
1.500	-150	-2150	-1150
1.562	-156	-2156	-1156
1.575	-156	-2156	-1156
1.625	-162	-2162	-1162
1.653	-165	-2165	-1165
1.688	-168	-2168	-1168
1.750	-175	-2175	-1175
1.812	-181	-2181	-1181
1.850	-185	-2185	-1185
1.875	-187	-2187	-1187
1.938	-193	-2193	-1193
2.000	-200	-2200	-1200
2.047	-206	-2206	-1206
2.062	-206	-2206	-1206
2.125	-212	-2212	-1212
2.165	-218	-2218	-1218
2.188	-218	-2218	-1218
2.250	-225	-2225	-1225
2.312	-231	-2231	-1231
2.375	-237	-2237	-1237
2.440	-244	-2244	-1244
2.500	-250	-2250	-1250
2.531	-250	-2250	-1250
2.562	-256	-2256	-1256
2.625	-262	-2262	-1262
2.677	-268	-2268	-1268
2.688	-268	-2268	-1268
2.750	-275	-2275	-1275
2.813	-281	-2281	-1281
2.834	-281	-2281	-1281
2.875	MS16625-287	MS16625-2287	MS16625-1287

APPROVED 11 DEC 1958 REVISED © FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21148 TY. I CL. 1	SUPERSEDES	SHEET 6

DD FORM 1 SEP 57 672-1 Coordinated

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, ML, AV
AIR FORCE - 82, 85

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

"Review" user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

FED. SUP CLASS
5340

SUBSTITUTION TABLE
CROSS REFERENCE OF PART NUMBERS

E HOUSING DIAMETER	INACTIVE STEEL △ DASH NO.	INACTIVE STEEL ZINC PLATED DASH NO.	SUBSTITUTE STEEL CADMIUM PLATED DASH NO.
2.953	MS16625-300	MS16625-2300	MS16625-1300
3.000	-300	-2300	-1300
3.062	-306	-2306	-1306
3.125	-312	-2312	-1312
3.149	-315	-2315	-1315
3.156	-315	-2315	-1315
3.250	-325	-2325	-1325
3.346	-334	-2334	-1334
3.469	-346	-2346	-1346
3.500	-350	-2350	-1350
3.543	-354	-2354	-1354
3.562	-354	-2354	-1354
3.625	-362	-2362	-1362
3.740	-375	-2375	-1375
3.750	-375	-2375	-1375
3.875	-387	-2387	-1387
3.938	-393	-2393	-1393
4.000	-400	-2400	-1400
4.125	-412	-2412	-1412
4.250	-425	-2425	-1425
4.330	-433	-2433	-1433
4.500	-450	-2450	-1450
4.625	-462	-2462	-1462
4.724	-475	-2475	-1475
4.750	-475	-2475	-1475
5.000	-500	-2500	-1500
5.250	-525	-2525	-1525
5.375	-537	-2537	-1537
5.500	-550	-2550	-1550
5.570	-575	-2575	-1575
6.000	-600	-2600	-1600
6.250	-625	-2625	-1625
6.500	-650	-2650	-1650
6.625	-662	-2662	-1662
6.750	-675	-2675	-1675
7.000	-700	-2700	-1700
7.250	-725	-2725	-1725
7.500	-750	-2750	-1750
8.000	-800	-2800	-1800
8.250	-825	-2825	-1825
8.500	-850	-2850	-1850
8.750	-875	-2875	-1875
9.000	-900	-2900	-1900
9.250	-925	-2925	-1925
9.500	-950	-2950	-1950
9.750	-975	-2975	-1975
10.000	MS16625-1000	MS16625-3000	MS16625-2000

△ SUBSTITUTE CORROSION RESISTING STEEL WHEN USED IN TEMPERATURES OVER 450° F AND FOR FOOD MACHINERY.

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES	SHEET 7

DD FORM 1 SEP 67, 672-1

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

FED. SUP CLASS
5340

RECOMMENDED DESIGN LIMITATIONS AND USAGE:

(a) INTENDED USE - TO PROVIDE SHOULDERS FOR POSITIONING AND RETAINING MACHINE COMPONENTS IN HOUSINGS (BORES). TAPERED DESIGN PRINCIPLE PERMITS RINGS TO MAINTAIN CONSTANT CIRCULARITY AND PRESSURE AGAINST BOTTOM OF GROOVE. THE USE OF THE FOLLOWING FORMULAS IS BASED ON THE FACT THAT THE RING WILL NOT FAIL IN COMPRESSION.

(b) ALLOWABLE THRUST LOAD CAPACITY OF THE RINGS. ABUTTING COMPONENTS TO HAVE SHARP CORNERS.

$$P = \frac{\pi HTX}{F}$$

WHERE:
P = ALLOWABLE THRUST LOAD (POUNDS).
H = HOUSING DIAMETER (INCHES).
T = RING, THICKNESS (INCHES).
X = ULTIMATE SHEAR STRENGTH OF THE RING MATERIAL (P.S.I.)*.
F = FACTOR OF SAFETY, F = 4, IS RECOMMENDED, SINCE THE RING UNDER LOAD IS SUBJECTED NOT ONLY TO PURE SHEAR STRESSES BUT ALSO TO BENDING STRESSES.

(c) ALLOWABLE LOAD CAPACITY OF GROOVE WALL =

$$P = \frac{\pi HdY}{F}$$

WHERE:
P = ALLOWABLE COMPRESSION LOAD (POUNDS).
H = HOUSING DIAMETER (INCHES).
d = GROOVE DEPTH (INCHES).
Y = YIELD STRENGTH IN COMPRESSION OF THE GROOVE MATERIAL (P.S.I.).
F = FACTOR OF SAFETY - TO INSURE A SAFE WORKING LOAD A SAFETY FACTOR, F = 2, IS RECOMMENDED.

(d) MINIMUM DISTANCE BETWEEN OUTER GROOVE WALL AND END OF HOUSING =

$$Z = 3d$$

WHERE:
Z = MINIMUM DISTANCE BETWEEN OUTER GROOVE WALL AND END OF HOUSING (INCHES).
d = GROOVE DEPTH (INCHES).

(e) ALLOWABLE HOUSING DIAMETER =

$$H = \sqrt{\frac{G^2 - 4FP}{Y\pi}}$$

WHERE:
H = ALLOWABLE HOUSING DIAMETER.
G = GROOVE DIAMETER.
F = FACTOR OF SAFETY (SEE FORMULA (c) ABOVE).
P = DESIGN LOAD.
Y = YIELD STRENGTH IN COMPRESSION OF GROOVE MATERIAL (P.S.I.).

(f) DIFFERENTIAL ROTATION:
THE CONDITIONS UNDER WHICH A RETAINING RING MAY BE USED WHEN ADJACENT PARTS ROTATE RELATIVE TO IT, FALL INTO TWO CATEGORIES:
(1) WHERE NO THRUST IS EXERTED BY ADJACENT PART: IN THIS CASE, DIFFERENTIAL ROTATION OF RING AND ADJACENT PART CREATES NO ELEMENT OF RISK IN THE APPLICATION OF THE RINGS BECAUSE NO FRICTIONAL TORQUE IS EXERTED BY THE MACHINE PART ON THE RING.
(2) CONSIDERATION MUST BE GIVEN TO THE MAGNITUDE OF THE THRUST INVOLVED. THE FRICTION MOMENT MAY NOT EXCEED THE BENDING MOMENT, WHICH THE RING CAN TOLERATE WITHOUT RELEASING ITS PRESSURE AGAINST THE BOTTOM OF THE GROOVE, FORMULATED AS FOLLOWS:

$$fPN \leq \frac{sTE^2}{18} \quad \text{OR} \quad P \leq \frac{sTE^2}{f18N}$$

WHERE:
P = ALLOWABLE THRUST LOAD EXERTED BY ADJACENT PART (POUNDS).
f = COEFFICIENT OF FRICTION.
s = WORKING STRESS OF RING UNDER MAXIMUM CONTRACTION (P.S.I.)*.
T = RING THICKNESS (INCHES).
E = GREATEST WIDTH SECTION OF RING (INCHES).
N = NEUTRAL RING DIAMETER (INCHES) = FREE DIAMETER MINUS 3/4 E DIMENSION.

IN SUCH CASES WHERE DIFFERENTIAL ROTATION OCCURS THE CALCULATION SHOULD BE BASED ON THE MAXIMUM POSSIBLE VALUE OF THE COEFFICIENT OF FRICTION.

(g) IMPACT CAPACITY OF RING OR GROOVE WALL:

$I_R = \frac{PT}{2}$ FOR THE RING (INCH POUNDS) ABUTTING COMPONENTS TO HAVE SHARP CORNERS.

$I_G = \frac{Pd}{2}$ FOR THE GROOVE (INCH POUNDS).

WHERE:
P = ALLOWABLE THRUST LOAD OF RING OR GROOVE (POUNDS).
T = RING THICKNESS (INCHES).
I_G = IMPACT CAPACITY OF GROOVE WALL (INCH POUNDS).
d = GROOVE DEPTH (INCHES).
I_R = IMPACT CAPACITY OF RING (INCH POUNDS).

* FOR RINGS OF STEEL X = 120,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR RING SIZES UP TO 3/4 INCH
X = 150,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR RING SIZES 3/4 INCH AND OVER.
s = 250,000 P.S.I. WORKING STRESS.

* FOR RINGS OF BERYLLIUM COPPER X = 110,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR ALL SIZES.
S = 180,000 P.S.I. WORKING STRESS.

APPROVED 11 DEC 1958 REVISED © FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES	SHEET 8

DD FORM 1 SEP 57 672-1 (Reverse)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

(h) LOAD CAPACITY, WITH THE RETAINED PART RADIUSED OR CHAMFERED:
WHEN THE RADIUS OR CHAMFER OF THE RETAINED PART DOES NOT EXCEED THE MAXIMUM RADIUS ALLOWED FOR THE BOTTOM OF THE RING GROOVE THE LESSER LOAD CAPACITY COMPUTED FROM THE FORMULAS ON SHEET 8 WILL APPLY. THE CORNER RADII AND CHAMFERS LISTED ON SHEETS 1 THRU 3 WERE CHOSEN AS LARGE AS POSSIBLE FOR THE RING SIZES INVOLVED AND ARE RELATED TO THE MAXIMUM THRUST LOADS LISTED IN THE TABLE BELOW.
IF THE CORNER RADII OR CHAMFERS ARE SMALLER THAN THOSE LISTED, THEN THE THRUST LOADS INCREASE PROPORTIONALLY, IN ACCORDANCE WITH THE FOLLOWING FORMULAS:

$$p^1 = \frac{PCH}{CH^1} \quad \text{OR} \quad p^1 = \frac{PR}{R^1}$$

WHERE: p^1 = NEW ALLOWABLE THRUST LOAD.
p = LISTED ALLOWABLE THRUST LOAD.
CH^1 = NEW (SMALLER) CHAMFER.
CH = LISTED CHAMFER
R^1 = NEW (SMALLER) CORNER RADIUS.
R = LISTED CORNER RADIUS

LIMIT LOADS LISTED BELOW ARE BASED ON RINGS OF STEEL OR STAINLESS STEEL (WORKING STRESS = 250,000 P.S.I. - TABLE I) AND OF BERYLLIUM COPPER (WORKING STRESS = 180,000 P.S.I. - TABLE II). IF THE ALLOWABLE GROOVE CAPACITY LOADS, AS CALCULATED BY USING THE FORMULA ON SHEET 8 ARE LESS THAN THEY SHOULD BE USED.

NOMINAL RING SIZE		ALLOWABLE THRUST LOAD FOR RING ASSEMBLIES WITH PARTS HAVING MAXIMUM CORNER RADII OR CHAMFERS.	
FROM	TO	TABLE I STEEL OR STAINLESS STEEL	TABLE II BERYLLIUM COPPER
.250	.312	190 LB	140 LB
.375	.453	530 LB	380 LB
.500	.750	1100 LB	800 LB
.777	.938	1650 LB	1200 LB
1.000	1.500	2400 LB	1700 LB
1.562	2.000	3900 LB	2800 LB
2.062	2.531	6200 LB	
2.852	3.000	9000 LB	
3.062	5.000	12000 LB	
5.250	6.000	15000 LB	
6.250	7.000	23000 LB	
7.250	10.000	34000 LB	

NOTE: THE ABOVE FORMULAS ARE NOT TO BE USED FOR BRITTLE MATERIALS SUCH AS CAST IRON, ETC.

WARNING: RINGS SHOULD NOT BE EXCESSIVELY CONTRACTED DURING INSTALLATION SINCE THIS WILL LEAD TO RING FAILURE. IF RING HAS PLAY BETWEEN THE GROOVE DIAMETER AND THE OUTSIDE RING DIAMETER THIS INDICATES THAT THE RING HAS BEEN EXCESSIVELY CONTRACTED, (PROVIDING GROOVE DIAMETER HAS BEEN MACHINED TO RECOMMEND DIMENSIONS).

USER SYMBOLS
NAVY - MC
ARMY - AT, MU, MF

REVIEWER SYMBOLS
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

"Review/user information is current as of the date of this document. For future consideration of changes to this document, draft circulation should be based on the information in the current DODISS."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Activities for all new engineering and design applications and for repetitive use shall be made from this document.

APPROVED 11 DEC 1958 REVISED © FOR CHANGES SEE SHEETS 1 THROUGH 10

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repairs are shall be made from this document.

FED. SUP CLASS
5340

NOTES:

1 - MATERIAL:
(a) STEEL, CARBON, FEDERAL STANDARD 66, STEEL NOS. 1066 THRU 1090, STEEL, CORROSION RESISTING, (SEE PROCUREMENT SPECIFICATION).
(b) BERYLLIUM COPPER, FEDERAL SPECIFICATION QQ-C-533.

2 - HARDNESS:

HOUSING DIA.	STEEL	HOUSING DIA.	CORROSION RESISTING STEEL	BERYLLIUM COPPER
.250 AND .312	ROCKWELL 15N-86-88	.250 AND .312	ROCKWELL 15N-82.5-86	ROCKWELL 15N-77-82
.375 TO .512 INCL.	ROCKWELL 30N-69.5-73	.375 TO 1.023	ROCKWELL 30N-63-69.5	ROCKWELL 30N-54-62
.562 TP .777 INCL.	ROCKWELL 30N-67.5-72	1.062 AND OVER	ROCKWELL C-44-51	ROCKWELL C-34-43
.812 TO 1.023 INCL.	ROCKWELL 30N-66-71			
1.062 TO 3.000 INCL.	ROCKWELL C-47-52			
3.062 AND OVER	ROCKWELL C-45-52			

3 - PROTECTIVE COATINGS AND TREATMENTS:
(a) CADMIUM PLATING, QQ-P-416, TYPE II, CLASS 3.
(b) CORROSION RESISTING STEEL RINGS SHALL BE PASSIVATED, QQ-P-35.
(c) PHOSPHATE COATING, MIL-G-16232, TYPE II.

4 - PART NUMBER - (MS NUMBER) - (RING DASH NUMBER).
EXAMPLE - MS16625-1100 IS THE PART NUMBER FOR A STEEL, INTERNAL RETAINING RING FOR USE IN A 1.000 DIAMETER HOUSING.

5 - DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED. DIMENSIONING AND TOLERANCING SHALL BE IN ACCORDANCE WITH USAS Y14.5.

6 - INACTIVATE FOR NEW DESIGN, UNCOATED STEEL AND ZINC PLATED STEEL, (SEE SUBSTITUTION SHEET 6 AND 7).

7 - THE GOVERNMENT HAS A ROYALTY FREE LICENSE UNDER WALDES KOHINOOR INC. COPYRIGHTS PERTINENT TO PORTIONS OF THE INFORMATION CONTAINED HEREIN AND UNDER THE FOLLOWING LISTED PATENT FOR THE BENEFIT OF MANUFACTURERS OF THE ITEM FOR THE GOVERNMENT OR FOR USE IN EQUIPMENT TO BE DELIVERED TO THE GOVERNMENT. (U. S. PATENT NO. 2,861,824).

FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID.

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. I	SUPERSEDES	SHEET 10

DD FORM 1 SEP 57 672-1 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE